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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/026,473	12/27/2001	Sunghoe Yoon	8733.573.00	7768
30827	7590	08/09/2004	EXAMINER	
MCKENNA LONG & ALDRIDGE LLP			DI GRAZIO, JEANNE A	
1900 K STREET, NW			ART UNIT	
WASHINGTON, DC 20006			PAPER NUMBER	
			2871	

DATE MAILED: 08/09/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/026,473

Applicant(s)

YOON, SUNGHOE

Examiner

Jeanne A. Di Grazio

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 27 May 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 December 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Claims***

Claims 1-14 are pending. Claims 1, 6, and 10 have been amended per Amendment of May 27, 2004.

### ***Priority***

Priority to Korean Patent Application No. 2001-25693 (May 11, 2001) is claimed.

### ***Claim Objections***

Claims 1, 6, and 10 are objected to because of the following informalities. Applicant has included the limitation, "wherein a refractive index of the overcoat layer is adjusted to make incident light be perpendicular to a surface of the cholesteric liquid crystal filter." This limitation is not correct. If there is no constraint on the angle of incident light upon the overcoat layer, then the limitation "wherein a refractive index of the overcoat layer is adjusted to make incident light be perpendicular to a surface of the cholesteric liquid crystal filter" will always be true. The incident angle of light must be constrained in order for the device to be rendered operable and consistent with the claimed limitation.

Furthermore, upon careful review of Applicant's Specification, it is not at all clear as to how the refractive index of the overcoat layer is adjusted to make incident light be perpendicular to a surface of the cholesteric color filter. Applicant has discussed how the protrusions on the color filter appear to be made; however, clearly, the overcoat layer is not the same as the

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photoresist used to make the protrusions on the color filter. Applicant has merely stated that the overcoat layer's refractive index is adjusted (Specification Pages 14-17 [relevant sections]) but has not provided evidence or insight into how the overcoat layer refractive index is so adjusted.

Because the Examiner is unable to interpret the true nature of the refractive index of the overcoat layer, the Examiner presumes that the overcoat layer reads on the applied prior art.

Appropriate correction is **required**.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claim 9 remains rejected under 35 U.S.C. 112, first paragraph, as based on a disclosure which is not enabling.

Per Applicant's enabling disclosure [0031-0033], an overcoat layer has to have a refractive index that is different from that of the cholesteric liquid crystal color filter in order to diffuse light, critical or essential to the practice of the invention, but not included in the claim(s) is not enabled by the disclosure. See *In re Mayhew*, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976).

An overcoat layer is essential to the claim in order to render the device operable. Clearly, the overcoat layer (150) is featured in Applicant's figures (Figure 3, Figure 4, and the completed product of Figure 5E)(Specification Page 14, last two lines, and Page 15, Lines 1-10).

Furthermore, if the overcoat layer is incorporated into the invention as merely to level the uneven surface of the color filter, then the diffusive cholesteric color filter as claimed by Applicant will not be able to diffuse light and will not work. Per Applicant's enabling disclosure, the overcoat layer is not just an overcoat layer, instead, this overcoat layer has a diffusive function. As such, these elements, critical to Applicant's invention, must be recited in independent claim 9.

It is respectfully noted, that the Examiner has previously required the above per Office Action of February 28, 2004. While Applicant amended claims 1, 6, and 10 in view of the Examiner's above findings, Applicant has not addressed this issue with respect to claim 9.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-5 and 8-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted Prior Art (Figure 1, conventional liquid crystal display device) in view of Fujiwara et al. (US 5,305,129) and further in view of Jones et al. (US 5,963,284).

Per claims 1 (amended)-5 and 8-9: Applicant's Admitted Prior Art (APA), Figure 1, teaches and discloses the following conventional elements of a reflective liquid crystal display. Specifically, APA has a first substrate (1) having a plurality of switching elements, a first

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electrode (3, plurality of reflective electrodes), a second substrate (2), a second electrode (5) beneath the second substrate (2) (common electrode, 5), a retardation layer (7) on the second substrate (2), and a polarizer (8) on the retardation layer (7), and a liquid crystal layer (6) between the first electrode (3) and the second electrode (5). A color filter (4) is furthermore formed beneath a second substrate (2).

APA does not appear to explicitly specify a cholesteric liquid crystal color filter on an absorption layer.

Fujiwara teaches a liquid crystal display device of optical writing type having a carbon dispersed light absorbing layer and a cholesteric reflector (Title, entire patent). Referring to Figure 1 of Fujiwara, the reflective cholesteric color filter / reflector (25) is formed on a light absorbing layer (24). Fujiwara has these elements for a liquid crystal display element of optical writing type of simple cell structure that can be manufactured easily (Summary of the Invention) and that utilizes light efficiently (Background of the Invention).

Fujiwara is evidence that ordinary workers in the field of liquid crystals would have had the reason, suggestion, and motivation to incorporate a cholesteric reflector into a liquid crystal display for the purpose of light efficiency in a simple cell structure that can be easily manufactured.

Therefore, it would have been obvious to one of ordinary skill in the art of liquid crystals at the time the invention was made to modify APA in view of Fujiwara for a reflective liquid crystal display of high light efficiency with a simple cell structure that can be easily manufactured.

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APA does not appear to explicitly specify a cholesteric liquid crystal color filter having a plurality of protrusions.

Jones, on the other hand, teaches and discloses a diffusive color filter (Figure 8) that contributes to the reduction of image parallax or pixel crosstalk, minimizes depolarizing effects, and that can be mass produced (Column, 2, Lines 32-41).

In Jones, referring to at least Figure 5, a diffusing layer (45) includes a plurality of discrete spherical beads (51) embedded in a host material (53)(Applicant's color filter having a plurality of protrusions). Host material (53) acts as color filter that selectively reflects and absorbs certain portions of the visible spectrum to produce a color filter effect (Column 6, Lines 43-48 and Column 7, Lines 3-18) like a cholesteric color filter that selectively reflects certain wavelengths of light.

The host material (53) may be considered as an overcoat layer since it is used in combination with the diffusing layer / color filter and appears to level the surface of the diffusive color filter (See Figure 8) and provides a diffusive color filter effect (Column 7, Lines 3-18). Because the Examiner is unable to interpret the true nature of the refractive index of the overcoat layer, the Examiner presumes that the host material / diffusive layer / color filter of Jones has a refractive index of the overcoat layer adjusted to make incident light be perpendicular to a surface of the cholesteric liquid crystal filter.

It may be presumed that shape, size, and distribution of the beads dispersed in the color filter are maximized for maximum diffusion and light distribution.

Jones is evidence that ordinary workers in the field of liquid crystals would have had the reason, suggestion, and motivation to incorporate a diffusive color filter into the APA prior art

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for the purpose of reducing image parallax or pixel crosstalk, minimizing depolarizing effects, and that can be mass produced (Column, 2, Lines 32-41).

Therefore, it would have been obvious to one of ordinary skill in the art of liquid crystals at the time the invention was made to modify APA and Fujiwara in view of Jones for a highly light efficient cholesteric color filter that has a diffusive property to thus reduce image parallax or pixel crosstalk, minimize depolarizing effects, and that can be mass produced (Column, 2, Lines 32-41).

Claims 6-7 and 10-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted Prior Art (Figure 1, conventional liquid crystal display device) in view of Fujiwara et al. (US 5,305,129) and further in view of Jones et al. (5,963,284).

Per claims 6 (amended)-7 and 10 (amended)-14: Applicant's recited method steps would have been rendered obvious to one of ordinary skill in the art of liquid crystals at the time the invention was made in view of the device as taught and disclosed by the above cited prior art and as previously applied to the device claims.

### ***Response to Arguments***

Applicant's arguments filed May 27, 2004 have been fully considered but they are not persuasive.

Applicant's only argument appears to focus upon United States Patent 5,963,284 (to Jones et al.) in that Applicant argues that Jones does not teach a cholesteric liquid crystal color filter having a plurality of protrusions (Arguments Page 7). However, Jones does teach and disclose a diffusive color filter wherein spherical beads (protrusions) are embedded into a host



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material. The host material, like a cholesteric color filter, acts to selectively reflect light of certain wavelengths as noted above.

Applicant has not argued the dependent claims and is presumed to have acquiesced to the rejections.

It is respectfully noted that Applicant has not addressed the 35 USC § 112 (1) rejection of claim 9 as previously noted above.

### ***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeanne A. Di Grazio whose telephone number is (571)272-2289.

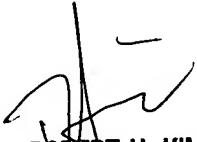
The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim, can be reached on (571)272-2293. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jeanne Andrea Di Grazio  
Patent Examiner  
Art Unit 2871

JDG

  
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